8-09 RAISED PAVEMENT MARKERS

8-09.1 Description

This Work shall consist of furnishing and installing pavement markers of the type specified in the Plans, in accordance with these Specifications, and at the locations indicated in the Plans or where designated by the Engineer. This Work also includes cleanup and disposal of cuttings and other resultant debris. The color of pavement markers shall conform to the color of the marking for which they supplement, substitute for, or serve as a positioning guide for.

8-09.2 Materials

Raised pavement marker (RPM) shall meet the requirements of the following sections:

RPM Type 1	9-21.1
RPM Type 2	9-21.2
RPM Type 3	9-21.3
Adhesive	9-02.1, 9-26.2

8-09.3 Construction Requirements

8-09.3(1) Surface Preparation

All sand, dirt, and loose extraneous material shall be swept or blown away from the marker location and the cleaned surface prepared by 1 of the following procedures:

When deemed necessary by the Engineer all surface dirt within areas to receive markers shall be removed. Large areas of tar, grease, or foreign materials may require sandblasting, steam cleaning, or power brooming to accomplish complete removal.

When markers are placed on new cement concrete pavement, any curing compound shall be removed in accordance with the requirements of this section and Section 5-05.3(13)A.

The pavement shall be surface dry. When applying Epoxy Adhesives in cool weather the pavement surface shall be heated by intense radiant heat (not direct flame) for a sufficient length of time to warm the pavement areas of marker application to a minimum of 70ºF.

Application of markers shall not proceed until final authorization is received from the Engineer.

8-09.3(2) Marker Preparation

Type 2 markers may be warmed prior to setting by heating to a maximum temperature of 120°F for a maximum of 10-minutes.

8-09.3(3) Adhesive Preparation

Epoxy adhesive shall be maintained at a temperature of 60ºF to 85ºF before use and during application.

Component A shall be added to component B just before use and mixed to a smooth uniform blend. The unused mixed adhesive shall be discarded when polymerization has caused stiffening and reduction of workability.

Bituminous pavement marker adhesive shall be indirectly heated in an applicator with continuous agitation or recurring circulation. Adhesive temperature shall not exceed the maximum safe heating temperature stated by the manufacturer. The Contractor shall provide the Engineer with manufacturers written instruction for application temperature and maximum safe heating temperature.

8-09.3(4) Application Procedure

8-09.3(4)A Epoxy Adhesives

The marker shall be affixed to the prepared pavement area with sufficient adhesive so as to squeeze out a small bead of adhesive around the entire periphery of the marker. The required amount of adhesive per marker will normally be in the range of 20 to 40-grams.

The sequence of operations shall be as rapid as possible. Adhesive shall be in place and the marker seated in not more than 30-seconds after the removal of the pavement preheat or warm air blast. The marker shall not have cooled more than 1-minute before seating.

The length of the pavement preheat or warming shall be adjusted so as to ensure bonding of the marker in not more than 15-minutes. Bonding will be considered satisfactory when adhesive develops a minimum bond strength in tension of not less than 800-grams per square inch or a total tensile strength of 25-pounds

Markers shall be spaced and aligned as shown in the Standard Plans and as specified by the Engineer. A displacement of not more than 1/2-inch left or right of the established guide line will be permitted. The Contractor shall remove and replace at no expense to the Contracting Agency all improperly placed markers.

Markers shall not be placed over longitudinal or transverse joints in the pavement surface.

On Roadway sections which are not open to public traffic, the preheating of the markers by dry heating before setting will not be required provided the adhesive develops the required bond strength of 800-grams per square inch in less than 3-hours. If the Roadway section is carrying public traffic during the installation of the markers, the 15-minute set-to-traffic provision will be enforced, and necessary flagging and traffic control will be required.

8-09.3(4)B Asphalt Adhesives

Thermoplastic Type 1 markers shall be installed only with a hot melt bitumen adhesive. At the option of the Contractor, a hot melt bitumen adhesive may be used to cement other types of markers to the pavement in lieu of epoxy adhesive. The bitumen adhesive shall conform to the requirements of Section 9-02.1(8).

Bituminous adhesive shall be applied at temperatures recommended by the manufacturer.

Markers shall be placed immediately after application of the adhesive.

8-09.3(5) Recessed Pavement Marker

The Contractor shall construct recesses for pavement markers by grinding the pavement in accordance with the dimensions shown in the Standard Plans. The Contractor shall prepare the surface in accordance with Section 8-09.3(1), and install Type 2 markers in the recess in accordance with the Standard Plans and Section 8-09.3(4).

8-09.4 Measurement

Measurement of markers will be by units of 100 for each type of marker furnished and set in place.

8-09.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Raised Pavement Marker Type 1", per hundred.

"Raised Pavement Marker Type 2", per hundred.

"Raised Pavement Marker Type 3-_____ In.", per hundred.

"Recessed Pavement Marker", per hundred.

The unit Contract price per hundred for "Raised Pavement Marker Type 1", "Raised Pavement Marker Type 3_____ In.", and "Recessed Pavement Marker" shall be full pay for furnishing and installing the markers in accordance with these Specifications including all cost involved with traffic control except for reimbursement for other traffic control labor, and for flaggers and spotters in accordance with Section 1-10.5.